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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,602	10/24/2003	Charlene W. Bayer	GTRC183	6490

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EXAMINER	
DRODGE, JOSEPH W	

ART UNIT	PAPER NUMBER
1723	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/693,602	BAYER ET AL.	
	Examiner	Art Unit	
	Joseph W. Drodge	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 May 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-5,7-9,11,12,15-18,20-22,24,33-35 and 37-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-12,15,16,18,20-22,24,33-35 and 37-45* is/are rejected.

7)☒ Claim(s) *17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1,3-5,7-9,10-12,15,16,18,20-22,24,33-35,37-39 and 41-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heskett et al patent 3,538,020, of record, in view of Kusunose et al patent 3,936,394, also of record, and admissions of the instant Specification.

For the independent claims, ***Heskett discloses a gas filter (column 1, lines 58-66) for adsorbing contaminants (column 2, lines 21-24 denote the structure as comprising ion-exchange resin, activated charcoal and/or greensand, all of which have adsorption properties, particularly the ion exchange material), the structure also including a polymer matrix having particle entrapping properties (column 2, line 68-column 3, line 64) and reactive additives (column 2, lines 21-30). He also discloses that the ion exchange material generally has relatively small particle sizes and hence relatively large surface area for sorption (column 4, lines 3-18). Heskett is silent as to specific capacity of adsorption, thus silent as to whether the media utilized has the claimed absorption capacity claimed ('at least about 0.01 gram of captured contaminants per gram of the absorptive system"); however it is obvious to the skilled artisan that the varied polymers (column 3, lines 55-58 and adsorption additives (disclosed in column 3, line 72-column 4, line 23) have a wide range of capacity, including the claimed range of sorption capacity, depending upon specific gas being treated and specific types of contaminants removed. Such is particularly obvious since the disclosed sorbents overlap the specific sorbents recited in the instant specification at pages 11 and 12 (polyvinyl polymers, polypropylene glycol, etc.).***

The claims now also differ in requiring the polymer matrix to have the properties of having a diffusivity greater than the recited value and glass transition temperature of less than about 20 degrees C. However, Heskett discloses use of polymeric material that may have polyester-based and polyamine based compounds (column 1, lines 20-25). Kusunose teach, in a filter used for filtering and adsorbing a wide variety of contaminants from a fluid (column 2, lines 21-56), and employ other polymeric compounds having a wider variety of diffusivities and glass transition temperatures including block and random copolymerized polyesters and co-polymerized polyamides that may include polyethylene and polypropylene (column 4, lines 17-68). These particular polymers are identified at pages 3 and 11 of the instant Specification as having the concerned diffusivity and glass transition temperature properties. It would have been obvious to have employed or also employed these polymeric materials taught by Kusunose, to facilitate optimum flux of the fluid being purified through the filtering and adsorbing material.

The claims may also differ in requiring additives which have additives which are reactive additives. Kusunose, in addition to additives such as activated carbon, teach employ of a wider range of reactive additives including nitrohumic acid and metal ions (column 9, lines 48-54 and column 10, lines 35-46). If necessary, it would have been further obvious to have employed also additives which are reactive, as suggested by Kusuonse, to sorb a wider range of contaminants.

Concerning various dependent claims: for claim 3, polydimethylsiloxane is disclosed at column 4, lines 55-57 of Heskett; for claims 5 and 38, the additives at least

comprise water (see column 6, lines 25-27 of Heskett); for claim 11, the additives may be uniformly distributed (column 5, lines 54-55 of Heskett); and for claim 15, non-reactive additives such as cross-linking agents are disclosed at column 7, lines 66-68).

For claims 16 and 41, water may constitute such non-reactive additive, when it is used to pre-shape the polymer (column 6, lines 44-48). For claim 45, see housing, such as a "filter cartridge" at column 11, lines 1,40 etc.

Claims 4 and 37 additionally require polyacrylamide polymer. Kusunose (column 4, lines 28-48) and (column 2, lines 22-32) teach polyacrylamide or similar polymers in a gas adsorption filter. It would have been obvious to have employed a polymer such as polyacrylamide in the Heskett device/method to adsorb a rich variety of different substances and contaminants.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heskett et al in view of Kusunose, and admissions of the instant Specification, as applied to claims 1 and 5 above, and further in view of Hirata et al patent 6,352,579. Claim 8 requires a sulfonic acid additive. Hirata teach at column 5,lines 62-65 to include sulfonic acid for the purpose of providing a cation exchange group. It would have been additionally obvious to have utilized the sulfonic acid group of Hirata to remove cationic impurities.

Claims 7 and 9 additionally require one of additives to comprise an amine. Heskett teach polyamine compounds at column 1, lines 23-24 for the purpose of .

Claim 12 requires the additives to form a layer in contact with but separate from a polymer matrix. Such structure is taught by Kusunose at column 11, lines 57-67 so as to form a laminate structure having ability to withstand fluid pressure and tensile stress.

Claims 18,20-22,24 and 42-44 require a substrate. Kusunose teach to use a substrate in a gas adsorption filter at column 11, line 55-column 12, line 34 to provide support for the adsorption matrix and form a laminate structure having ability to withstand fluid pressure and tensile stress. The substrate may be a polyamide, a cellulosic material or other of the polymers listed in claims 20,21,43 and 44, see Kusanose at column 12, lines 6-12. Heskett disclose to house the adsorption filter in a cartridge at column 11, lines 1 and 40 for claim 22.

For claim 33, Kusunose also teach at column 2, lines 43-44 and column 9, lines 18-23 that an adsorption filter may also remove biological contaminants by using materials having biostat properties.

Claims 10 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heskett et al in view of Kusunose and admissions of the instant Specification, as applied to claims 1-3,5 and 35 and further in view of Koper et al patent 6,057,488. Koper et al teach at column 2, lines 21-52, etc.to include nanoparticles in a system for filtering or adsorbing contaminants from a fluid. It would have been further obvious to one of ordinary skill in the art to have utilized such nanoparticles in the gas adsorption filter of Heskett or Kusunose, since nanostructured adsorbents can be tailored to adsorb a wide variety of biological and chemical agents.

Claim 17 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. None of the prior art suggests all of the

materials encompassed in claim 17 including sulfonic acid beads, sorbitol and water in the filter media.

Applicant's arguments with respect to claims 1,3-5,7-12,15-18,20-22,24 and 33-45 have been considered but are moot in view of the new ground(s) of rejection. The polymers utilized in Kusunose are the same ones detailed in the instant Specification as having the desired diffusivity and glass transition temperature properties.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Seguin et al patent 7,022,158 also teach use of nanoparticles in a gas adsorption filter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Drodge at telephone number 571-272-1140. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Griffin, can reached at 571-272-1189. The fax phone number for the examining group where this application is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either private PAIR or Public PAIR, and through Private PAIR only for unpublished applications. For more

information about the PAIR system, see http://pair-direct.uspto.gov. Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JWD

May 15, 2007

JOSEPH DRODGE
PRIMARY EXAMINER